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HEALTH CARE SYSTEM AND METHOD THEREOFBACKGROUND OF THE INVENTION

## (a) Field of the Invention

5 The present invention relates to a health management system and a health management method for a user to effectively control his weight via a professional doctor's prescription.

## (b) Description of the Related Art

In response to the lifestyle changes and complications of society, 10 various diseases of adult people have been induced and interest in health issues has increased. In particular, interest in people's weight has become connected to beauty and adult diseases, and various products have been developed to deal with this.

However, most related art health management devices simply compute 15 and inform a user of obesity, a normal weight, an encouraged caloric intake per day for an ideal body weight, or calories consumed in a day, or inform the user of a weight change determined by deducting his caloric consumption from his caloric intake.

Therefore, the related art health management devices have problems in 20 that it is impossible to provide information on the way to reach a desired weight, or consider a personal clinical history or dietary habits.

Further, the related art health management devices have a disadvantage in that it is difficult to effectively control a weight since an encouraged caloric consumption per day with relation to an encouraged caloric

intake per day is not suggested.

Furthermore, the related art healing management devices have the disadvantage in that it is impossible to receive a professional doctor's advice required for weight control as frequently as desired.

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## SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to an apparatus and method for format converting a video that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

10 In view of the prior art described above, it is an object of the present  
invention to provide a health management device which includes a data  
transmission and receiving element, so that a professional doctor analyzes  
personal data such as personal clinic history and dietary habits, caloric intake  
and caloric consumption, and body data of a user and suggests a prescription  
15 for encouraged caloric intake and consumption per day as well as content of  
activity for the caloric consumption by means of the data, and the user can input  
his food intake and activity contents and receive prescriptions of the doctor at  
any time.

It is another object of the invention to provide a health management system and a health management method which have medical professionalism, mobility and convenience so that adult diseases due to the lack of nutrients or worse caused by inappropriate dietary habits for weight control, overeating of food and lack of exercise may be prevented and beauty may be promoted by controlling weight and managing health effectively.

In order to achieve the above objects and other advantages, a health management system and a health management method according to the present invention may provide a professional doctor's prescription for weight management of a user according to the personal data input by the user such as body data, clinical history, dietary habits, caloric intake and activity contents.

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According to one aspect of the present invention, a health management device includes an input part, a control part, a memory part and an output part.

The input part is to input basic data of a user.

The control part computes an ideal body weight, a body mass index and 10 a waist/hip circumference ratio on the basis of the basic data for suggesting a prescription by computing an encouraged caloric intake per day, distribution of respective nutrients and an encouraged calorie consumption per day, and suggests a prescription of an amount of one or more food each other and time of activity on the remaining intake calories and consumption calories by 15 analyzing calories already taken in and consumed by a predetermined time point in a day when a user inputs desired food or activity content.

The memory part stores the input content of the input part and stores software and data required for the processing of the control part.

The output part outputs a result processed by the control part and the 20 basic data.

According to another aspect of the present invention, in a health management device including an input part for inputting basic data, a control part for suggesting a prescription on the basis of the basic data, a memory part for storing the basic data and software and data required for the process to be

performed by the control part, and an output part for outputting a result of the process performed by the control part, a health management method includes the steps of inputting basic data, selecting functions, computing a total caloric consumption in a day, computing a total caloric intake in a day, outputting a 5 current weight status, recognizing a desired weight, and estimating a weight after a predetermined period or a period to reach the desired weight.

The step of inputting basic data is carried out by storing the basic data input in the input part by a user.

The step of selecting functions is carried out by selecting a function to 10 be used by the user from all functions provided and performed by the health management device.

The step of computing total caloric consumption in a day is carried out by performing a function for computing total consumed calories by activity in a day and remaining encouraged caloric consumption on the basis of the basic 15 data.

The step of computing total caloric intake in a day is carried out by computing total calories taken in a day and remaining encouraged caloric intake on the basis of the basic data.

The step of outputting a current weight status is carried out by outputting 20 a current weight status on the basis of the basic data in the function selected by the user.

The step of recognizing a desired weight is carried out for suggesting a prescription for a procedure to reach the desired weight.

The step of estimating a weight change is a step for performing a

function for estimating a controllable weight from the present to a desired period or a period to reach a desired weight according to whether the user selects and inputs the desired period or the desired weight on the basis of the caloric intake per day and the caloric consumption per day from a predetermined time point in 5 the past to the present.

In a health management device including an input part for inputting basic data, a control part for analyzing the basic data and assessing a desired body data on the basis of the basic data, a memory part for storing the basic data and software and data required for the process to be performed by the 10 control part, an output part for outputting a result of the process performed by the control part, a data conversion device and a data transmitting and receiving device, a health management system includes a network and a database server.

The network is to transmit data output from the health management device, and the database server is to store the data transmitted via the network 15 for transmitting a prescription of a doctor on the basis of the transmitted data to the health management device via the network.

Wherein, the database server has functions for analyzing the basic data, assessing a desired body data on the basis of the basic data and transmitting a prescription of a doctor to the health management device.

20 A health management method according to a first embodiment of the present invention includes the steps of connecting the database server to the health management device via a network, storing analysis data of the basic data and assessment data of the desired body data transmitted from a health management device, and transmitting prescription data of a doctor who inspects

the analysis of the basic data and the assessment of the desired body data of the database server by the network.

According to the first embodiment of the present invention, in a health management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the basic data and the desired body data, a health management method includes the steps of connecting the database server to the health management device via a network, storing analysis data of the basic data and assessment data of the desired body data transmitted by the health management device in the database server, and transmitting a prescription of a doctor who inspects the analysis data of the basic data and the assessment data of the desired body data to the health management device via the network.

15 In a health management device including an input part for inputting basic data, a control part for analyzing the basic data and assessing the desired body data, a memory part for storing the basic data and software and data required for the process to be performed by the control part, and an output part for outputting a result of the process performed by the control part, a data conversion part and a wireless transmitting and receiving device, a health management system according to a second embodiment of the present invention includes a base station, a base station control part, a network switch and a database server.

The base station is wirelessly connected to the health management

device by using multi-connection communications techniques and protocol to wirelessly connect the health management device to a database server.

The base station control part manages communications frequencies between the health management device and the base station for monitoring and 5 controlling the base station.

The database server stores information on the installation, management and repair, and connection attestation in the wireless communications connection with the health management device, and transmits prescription data of a doctor to the health management device according to the basic data of a 10 user by being connected to the health management device via the base station.

The network switch connects the base station control part to the database server.

Wherein the database server may also analyze the basic data of the user and assess the desired body data on the basis of the basic data instead of 15 the health management device.

In a health management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the 20 basic data and the desired body data, a health management method according to a second embodiment of the present invention includes the steps of wirelessly connecting a base station to the health management device by using multi-connection communications techniques and protocol, storing analysis and assessment of the basic data and the desired body data in a database server,

and transmitting prescription data of the database server, that is, the inspected analysis and assessment of the basic data and the desired body data, to the health management device via the database server, a network switch, a base station control part and the base station.

5       Wherein, in the health management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the basic data and the desired body data, the health management 10 method according to the second embodiment of the present invention may includes the steps of wirelessly connecting a base station to the health management device by using multi-connection communications techniques and protocol, storing the analysis and assessment of the basic data and the desired body data in the database server, storing analysis and assessment results of 15 the basic data and the desired body data performed by the database server in the database server, and transmitting prescription data of a doctor who inspects the analysis and assessment results stored in the database server to the health management device via the database server, a network switch, a base station control part and the base station.

20       Both the foregoing general description and the following Detailed Description are exemplary and are intended to provide further explanation of the invention as claimed.

### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings provide a further understanding of the invention and, together with the detailed description, explain the principles of the invention. In the drawings:

5 Fig. 1 is a block diagram of a health management device according to the present invention;

Fig. 2 is a flow chart for explaining a health management method according to the present invention;

10 Fig. 3 is a flow chart for explaining a health management system according to a first embodiment of the present invention;

Fig. 4 is a flow chart for explaining a health management method of the health management system according to the first embodiment of the present invention;

15 Fig. 5 is a block diagram showing a health management system according to a second embodiment of the present invention; and

Fig. 6 is a flow chart showing a health management method of the health management system according to the second embodiment of the present invention.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be described in detail with reference to the accompanying drawings.

Fig. 1 is a block diagram showing a health management device

according to the present invention.

Referring to Fig. 1, a health management system 100 according to the present invention includes an input part 110, a control part 120, a memory part 130 and an output part 140.

5 The input part 110 is to input personal data of a user, body data, current clinical history and habits, kind and amount of food taken by the user, and activity contents. The personal data of the user means the date of birth and the distinction of sex, and the body data means height, weight, waist size, hip size and activity degree regarded as factors for computing an encouraged caloric 10 intake per day according to the routine activity of the user.

The control part 120 provides a caloric intake per day, distribution of nutrients, and an encouraged caloric intake per day, computes an ideal body weight, a body mass index and a waist/hip circumference ratio on the basis of past and present body data and a desired body data, analyzes a transition of 15 body data of the user, and computes encouraged caloric intake and consumption per day according to the activity of the user.

A prescription for the health of the user on the basis of above includes amount and kind of food, and time and content of activity for controlling excessive or insufficient calorie amounts.

20 The memory part 130 stores the input content of the input part 110, and software and data required for the process to be performed by the control part 120.

The output part 140 outputs contents input by the user, and a result of the process performed by the control part 120 visually and aurally.

Fig. 2 is a flow chart showing a health management method according to the present invention.

As shown in Fig. 2, a health management method according to the present invention includes the steps of inputting basic data S100, selecting 5 functions S200, computing total calories taken in a day S300, computing total calories consumed in a day S400, recognizing a current weight S500, recognizing a desired weight S600, and simulating a future weight S700.

In step S100, a user inputs personal data such as the date of birth and the distinction of sex, kind and amount of food taken by the user, activity 10 contents per day, body data and current clinical history, pregnancy and nursing status, and dietary habits in the input part 110 and the above data is stored in a memory part 130.

At this time, the body data indicates past and present body data such as height, weight, waist size, hip size and activity degree together with respective 15 data measuring dates.

An amount of activity per day means content and hours of activities taken in a day by the user. In the present invention, the activity content is organized by eating, reading newspapers, talking, driving a car, watching TV, office work and sleeping, wherein other various activities may be added.

20 In step S200, the user selects a function to use out of various functions provided by the health management device 100.

In step S300, total caloric intake of the user is computed on the basis of the basic data input in step S100, wherein total calories and nutrients taken in a day are analyzed in step S305, and the total calories and nutrients taken in a

day and a remaining encouraged caloric intake and nutrients for the day are output in step S310.

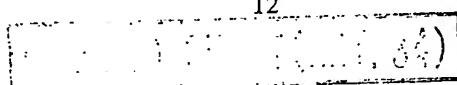
If a signal for selecting a function for computing the total caloric intake per day is received by the control part 120 by the selection of the user in step 5 S200, the control part 120 computes the total calories and nutrients taken in a day on the basis of the calories and nutrients taken for a day input in step S100.

In step S400, total calories consumed by activities of the user in a day are computed on the basis of the basic data input in step S100, wherein the total calories consumed a day are analyzed in step S405 and the total calories consumed in a day and an encouraged caloric consumption of the day, and a predictive total caloric consumption in a day are output in step S410.

In step S405, the control part 120 receives a signal selecting a function for computing total caloric consumption in a day by the selection of the user in step S200, and the control part 120 computes the total calories consumed by the user in a day on the basis of the amount of activity undertaken by the user in the day which was input in the basic data input step S100.

That is, as the user inputs time of each activity in the activity contents, the control part 120 computes the caloric consumption according to each of the activities and hours of the activities in view of the current weight by using a 20 computation formula stored in the memory part 130.

In step 410, the control part 120 outputs the total caloric consumption and a predictive total caloric consumption in a day computed in step S405 by the output part 140 and the encouraged caloric consumption of the user on the basis of the basic data input in the basic data which was input in step S100 by



the output part 140.

In step S500, a current weight status on the basis of the basic data is output, wherein the basic data is analyzed in step S505 and a prescription for the current weight is output in step S510.

5 In step S505, the basic data input in the basic data input step S100 is analyzed with relation to a desired weight or a desired period according to whether the user inputs the desired weight or a desired period in the selecting step. On the other hand, the basic data input in the basic data input step S100 is analyzed with relation to the current weight when the user does not input  
10 either the desired weight or the desired period. The control part 120 compares and analyzes the desired weight with the current weight, or the current weight with an ideal weight, for assessing how much the desired weight or the ideal weight is achieved.

15 In step S510 for outputting a prescription for the current weight, the control part 120 determines a lower weight, a normal weight, an overweight and obesity by comparing the desired weight with the current weight, or the current weight with the ideal weight, suggests the degree of the waist/hip circumference and suggests a prescription per day according to the determination, wherein the control part 120 suggests an appropriate way to achieve weight control  
20 according to the determination contents.

Step S600 for recognizing a desired body weight is carried out for suggesting a prescription of the weight control for the user to reach his desired body weight for a desired period and includes the steps of setting a desired body weight S605, assessing desired body data S610 and suggesting a

prescription with relation to the assessment S615.

In step S605, body data desired by the user is stored in the memory part 130 via the input part 110.

In step S610, the desired body data input in step S605 is compared with 5 the current basic body data input in step S100 for assessing a current status.

In step S615, the control part 120 analyzes various factors such as current weight, obesity, waist/hip circumference, personal clinical history, habits, etc. and suggests the way for controlling his weight, that is, appropriate speed of the weight control, caloric intake per day, increase or decrease of calories, 10 caloric consumption per day, encouragement or limitation of intake food, encouraged activity names, etc. by the output part 140.

In the future weight simulation step S700, a weight of the user or a controllable weight of the user after a predetermined period from the present, or a period to reach the desired body weight from the current weight is estimated 15 on the basis of the caloric intake and consumption per day, or the weight change from a predetermined time point in the past to the present. The future weight simulation step S700 includes the steps of selecting either designation of a desired value (a desired period or a desired weight) or not in step S710, selecting either an estimated period or an estimated weight in step S715, 20 inputting an estimated period in step S720, inputting an estimated weight in step S725, performing a first simulation in step S730, performing a second simulation in step S735, selecting either a desired period or a desired weight in step S740, inputting a desired period in step S745, inputting a desired weight in step S750, performing a third simulation in step S755, and performing a fourth

simulation in step S760.

The step S710 for selecting either designation of a desired value (a desired period or a desired weight) or not is carried out for determining whether to set a basis for the estimation of the controllable weight range of the user in 5 the future with a desired period or weight, or dietary habits from the past to the present.

The step S715 for selecting either an estimation period or an estimation weight is carried out for determining whether to set a basis for the estimation of the future body data with a period or a weight.

10 The first simulation is performed in step S730 in response to the input of a period by the user in step S720, while the second simulation is performed in step S735 in response to the input of a weight by the user in step S725,

15 The step S740 for selecting either a desired period or a desired weight is carried out for determining whether to set a basis of estimation of future body data with a desired period or a desired weight.

The third simulation is performed in step S755 in response to the input of a desired period by the user in step S745, while the fourth simulation is performed in step S760 in response to the input of a desired weight by the user in step S750.

20 In the first simulation step S730, the control part 120 outputs an estimated weight value on the basis of the caloric intake and consumption per day or the change of the weight from a predetermined time point in the past to the present, as the user inputs an estimated period in step S720.

In the second simulation step S735, the control part 120 outputs an

estimated period on the basis of the caloric intake and consumption per day or the change of the weight from a predetermined time point in the past to the present, as the user inputs an estimated weight in step S725.

In the third simulation step S755, the control part outputs a controllable  
5 weight from the present to a desired period, as the user inputs the desired period in step S745.

In the fourth simulation step S760, the control part outputs a period to reach a desired weight in the present state, as the user inputs the desired weight in step S750

10 Fig. 3 shows a health management system according to a first embodiment of the present invention.

As shown in Fig. 3, a health management system according to a first embodiment of the present invention includes a health management device 100', a database server 300 and a network 310.

15 The health management device 100' includes the components of the health management system 100 as shown in Fig. 1, and performs the basic function thereof. The health management device 100' may be connected to a database server 300 by a data converting device (not shown) and a data transmitting and receiving device (not shown).

20 The database server 300 stores data required for suggesting a prescription revised by a doctor of the user, and is connected to the health management device 100' by a network 310 for transmitting the prescription which is suggested by the doctor appropriately for the characteristics of the user on the basis of the basic data of the user transmitted by the health management

device 100' to the health management device 100' by the network 310.

If any new items are generated, the database server 300 transmits the new items to the health management device 100' for the update of the memory content of the health management device 100'.

5 The network 310 connects the health management device 100' to the database server 300 and performs arbitration of the data transmission between the health management device 100' and the database server 300.

10 Fig. 4 is a flow chart for explaining a health management method according to the health management system of the first embodiment of the present invention.

15 As shown in Fig. 4, the health management method of the health management system according to the first embodiment of the present invention includes the steps of connecting the network in step S805, storing data of the health management device in the database server in step S810, and transmitting a prescription of a doctor to the health management device in step S820.

In the network connection step S805, the health management device 100' is connected to the database server 300 by the network 310.

20 In the database storing step S810, the analysis data of the basic data and assessment data of the desired body data of the health management device are stored not only in the memory part of the health management device 100' but also in the database server 300 for the inspection of a doctor in charge of the user.

In the prescription suggestion step S815, the doctor suggests a

prescription appropriate for the characteristics of the user after inspecting the user's clinical history, dietary habits and degree to how much the user reaches the desired body by reviewing the analysis data of the basic data and the assessment data of the desired body data of the health management device. As the suggested prescription of the doctor is stored in the database server 300, the database server 300 transmits the suggested prescription of the doctor to the health management device 100' by the network 310, so that the memory content of the health management device 100' is updated.

In the prescription output step S820, the health management device 100' having received the doctors prescription, outputs a basic prescription stored in the memory part of the health management device 100' and the prescription received from the doctor simultaneously.

Fig. 5 is a block diagram showing a health management system according to a second embodiment of the present invention. As shown in Fig. 5, the health management system according to the second embodiment of the present invention includes a health management device 100", a base station 510, a base station control part 530, a network switch 550 and a database server 570.

The health management device 100" includes the components of the health management system 100 as shown in Fig. 1, and performs the basic function thereof. The health management device 100" further includes a data converting device (not shown) and a wireless data transmitting and receiving device (not shown) and may be connected to the database server by the base station 510, the base station control part 530, and the network switch 570.

The base station 510 is wirelessly connected to the health management device 100" using multi-connection communications techniques such as CDMA and TDMA, or protocol to wirelessly connect the health management device to the database server.

5 The base station control part 530 manages communications frequencies between the health management device 100" and the base station 510 for monitoring and controlling the base station.

10 The database server 570 stores information on the installation, management and repair, connection attestation, fee calculation and other problems in the wireless communications connection with the health management device 100", and transmits prescription data of a doctor to the health management device 100" on the basis of the basic data of a user by being connected to the health management device 100" via the base station 510. Further, if any new items are generated, the database server 570 transmits 15 the new items via the base station 510 for updating the memory content of the health management device 100"

The network switch 550 connects the base station control part 530 to the database server 570.

20 Fig. 6 is a flow chart for explaining a health management method of the health management system according to the second embodiment of the present invention.

As shown in Fig 6, the health management method of the health management system according to the second embodiment of the present invention includes the steps of connecting a base station to the health

management device in step S905, storing data of the health management device to the database server in step S910, suggesting a doctor's prescription in step S915, and outputting prescriptions in step S920.

In the connecting step S905, the health management device 100" is  
5 connected to the base station wirelessly by using multi-connection  
communications techniques such as CDMA or TDMA and protocols.

In the data storing step S910, the analysis and assessment of the basic  
data and the desired body data of the health management device 100" is stored  
not only in the memory part of the health management device 100" but also in  
10 the database server 570 for the inspection of a doctor in charge of the user.

In the prescription suggestion step S915, the doctor suggests a  
prescription appropriate for the characteristics of the user after inspecting the  
user's clinical history, dietary habits and degree to how much the user reaches  
the desired body by reviewing the analysis data of the basic data and the  
15 assessment data of the desired body data of the database server 570. As the  
suggested prescription of the doctor is stored in the database server 570, the  
database server 570 transmits the suggested prescription of the doctor to the  
health management device 100" by the network switch 550, the base station  
control part 530 and the base station 510, so that the memory content of the  
20 health management device 100" is updated.

In the prescriptions output step S920, the health management device  
100" that received the doctor's prescription outputs a basic prescription stored  
in the memory part of the health management device 100" and the received  
prescription of the doctor simultaneously.

As described hereinabove, the health management system and the health management method according to the present invention may provide a doctor's prescription according to the basic data of the user.

As described hereinabove, according to the health management system 5 of the present invention, the prescription of a professional doctor is always available. Further, the health management system is convenient for weight control and health management. Therefore, not only obese people but also people with a normal weight condition may be protected from diseases of adults brought upon them through lack of nutrients or worse due to inappropriate 10 dietary habits by proper dietary habits and weight control provided by the health management system of the present invention. For example, a hypertensive may be protected from the overeating of salt or cholesterol related to the hardening of the arteries and a diabetic may be protected from various complications, since the caloric intake per day and an amount of exercise may be suggested 15 for the sake of the blood sugar level.

It will be apparent to those skilled in the art that various modifications and variations can be made to the system and method of the present invention without departing from the spirit and scope of the invention. The present invention covers the modifications and variations of this invention provided they 20 come within the scope of the appended claims and their equivalents.